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DIPHTHERIA TOXOID TREATMENT OF LEPROSY

A PRELIMINARY REPORT

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In view of the early favorable reports of Collier (*1*) on the treatment of leprosy with diphtheria toxoid, it was decided to try this treatment on some of the patients at the United States Marine Hospital in Carville, La. Since one of the outstanding claims made for this new therapy was the abolition of leprotic reactions, it was thought best to start with a group of patients who had been having frequent acute leprotic reactions with evanescent tubercles and fever. Twelve such patients were selected and were started on the diphtheria toxoid treatment during the period from October 1940 to February 1941. The technique used was that advocated by Collier (*2*). This first group of patients was classified as follows: L_1 2 cases, L_2 4 cases, L_2N_1 1 case, L_3 3 cases, and L_3N_3 2 cases (*3*).

Of this group, 5 patients were given doses of 1 cc. of diphtheria toxoid prior to February 1941 and have continued the course of monthly injections to the date of this report. They have therefore received the largest amount of toxoid over the longest period of time.

One of these patients, M. L. (L_1), gives a history of having had periodic leprous reactions, consisting of fever and outcropping of evanescent tubercles, which would clear up and in a few weeks recur. She was given the first injection of 1 cc. of diphtheria toxoid on October 25, 1940. This dose was repeated on November 1, November 5, November 19, and December 3. Then, after a short rest, she began taking it again in February 1941 in doses of 1 to 3 cc., with the group of patients starting the toxoid treatment at that time. During the course of treatment this patient's reactions would clear up for a while and then would recur. Some of the later reactions were more severe than those she experienced before starting the diphtheria toxoid. These reactions have continued unabated. She has received to date a total of 24 cc. of toxoid. Leprous lesions, as well as leprous reactions, have become progressively worse.

Another patient, L. S. C. (L_3), had been having severe leprous reactions with the disease progressing unfavorably. On November 5, November 19, and De-

cember 3, 1940, she was given 1 cc. of diphtheria toxoid. Then, in February 1941, she continued the treatment with the other patients. There has been a continuation of the leprous reactions in this case with the disease slowly becoming worse. No lessening in the severity of the reactions was noted. This patient has received a total of 23 cc. of toxoid.

J. C. (L_2) had been having more or less continuous outcropping of evanescent tubercles for a year. On December 17 and December 24, 1940, he was given 1 cc. of diphtheria toxoid, and in February 1941 continued the treatment with the group of patients started at that time. After the first injection of toxoid, he had a severe reaction followed by a larger number of tubercles than before. He has continued to have periodic attacks of tubercles but says that recently they have not been so severe as previously. In all, he has received a total of 22 cc. of toxoid.

J. S. (L_1) gives a history of having had tubercles for 3 weeks prior to January 13, 1941, on which date 1 cc. of diphtheria toxoid was given. This dose was repeated on January 20 and 27 and monthly thereafter in doses up to 3 cc. starting in February. He has been given a total of 23 cc. of toxoid. For the past 4 months he has been free of tubercles.

A. W. (L_3N_3) had been having many attacks of leprous reactions with tubercles and the disease was progressing unfavorably. She was started on 1 cc. injections of diphtheria toxoid on December 3, 1940. This dose was repeated on December 11 and 16, and thereafter she continued treatment with the group of patients started in February 1941. There has been no lessening in the leprous reactions, and the disease continues to progress. She has received a total of 23 cc. of diphtheria toxoid.

In addition to the above cases, 7 patients who had not had any recent leprous reactions started treatment in February 1941. Six of these have continued the treatment to the date of this report and have received a total of 20 cc. of diphtheria toxoid. The seventh patient discontinued the treatment voluntarily after the ninth month because he felt that it was injurious to him. Examination of the patient at that time showed clinical evidence that the disease had been aggravated. Two of this last group of patients have experienced severe leprous reactions with tubercle formation since commencing the special treatment.

Of the 11 patients who have persisted in the diphtheria toxoid therapy to the present date, examination shows that 1 (L_1) is slightly improved, 3 are in a stationary state, and 8 are in a worse condition than at the start of the experiment.

In March 1941 it was decided to carry on a more extensive and carefully controlled study of diphtheria toxoid therapy. Seventy-one patients volunteered for this experiment. Before starting treatment all patients were thoroughly examined and classified. Photographs were taken of their more prominent lesions and charts were made of anesthetic areas. On the basis of these findings the patients were divided into two groups as nearly similar as possible. To one group of 36 patients diphtheria toxoid therapy was administered according to the technique recommended by Collier. To the other group of 35 patients, used as controls, like dosages of the broth from which the diphtheria toxoid is produced were administered.

After 10 months of treatment, during which 18 cc. of diphtheria toxoid or broth were given to each patient, a complete reexamination was performed on every patient and new neurological charts were made. New photographs duplicating previous exposures were made of lesions wherever there was any indication of changes either for better or for worse. Tables 1 and 2 show the results of these examinations. Since one of the toxoid-treated patients absconded before reexamination, an equal number of patients appears in each group.

TABLE 1

Classification	Group given toxoid							Control group						
	Great improvement	Moderate improvement	Slight improvement	Unchanged	Slightly worse	Moderately worse	Much worse	Great improvement	Moderate improvement	Slight improvement	Unchanged	Slightly worse	Moderately worse	Much worse
N_1					1						1			
N_2				1	1	1					1			
N_3						1					1			
Nt		1	1							2	1			
L_1			1	1			1		1	3				
L_1N_1											1			
L_2	1	1	2	3	6	1			1	3	7	3		
L_2N_1				2	1						1			
L_3			1	1	2	1			1		1	3		
L_3N_1				1							2		2	
L_3N_2				1	1									
Total	1	2	5	10	12	4	1		3	8	16	6	2	

TABLE 2

	Group given toxoid			Control group		
	Improved	Stationary	Worse	Improved	Stationary	Worse
Neural cases	0	1	4	0	3	0
Tuberculoid	2	0	0	2	1	0
Lepromata	6	9	13	9	12	8
Total	8	10	17	11	16	8

From these tables it can be seen that the results in the control group were better than those in the group given toxoid.

On two occasions Dr. G. W. McCoy examined a number of patients at random, without knowing which were toxoid-treated and which were control cases. Tables 3 and 4 show the results of these examinations.

the diphtheria toxoid is produced were administered.

TABLE 3.—*Patients examined on July 24, 1941*

	Patients given toxoid	Controls
Slightly improved	2	3
Stationary or slightly improved	3	3
Stationary	10	15
Stationary or slightly worse	3	6
Slightly worse	2	2
Total	20	29

TABLE 4.—*Patients examined on November 21, 1941*

	Patients given toxoid	Controls
Improved	2	2
Slightly improved	4	0
Stationary	4	6
Slightly worse	1	0
Worse	3	0
Total	14	8

It can be seen from the preceding tables that there is no indication that the toxoid treatment had a favorable action on leprosy.

Sedimentation tests were run on all patients before treatment and at the 10-month check-up period. The Cutler technique was used. Results of the tests are shown in table 5.

TABLE 5.—*Sedimentation tests*

	Improved	Stationary	Worse
Groups given toxoid	6	22	7
Control group	7	24	4

If there were differences of less than 3 mm. in the tests run at the beginning and at the end of the 10-month period the condition was considered stationary. An increase of 3 mm. or more was listed as worse and a decrease of 3 mm. or more as improved. The results of the sedimentation test were more favorable in the control group.

While our experimental study is not complete, we have thus far seen no conclusive beneficial effects from diphtheria toxoid therapy in leprosy. It is proposed that the experimental treatment be continued for 2 months more, and then be followed by an observation period of 3 months before a complete report of the study is made. In the meantime, because of numerous inquiries on the subject, it was felt that a preliminary report showing the trend of diphtheria toxoid treatment in leprosy as observed at the United States Marine Hospital, Carville, La., would be of interest.

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THE EFFECTS OF DISTILLERY WASTES AND WATERS ON THE MICROSCOPIC FLORA AND FAUNA OF A SMALL CREEK[1]

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The immediate effects of sewage on the microscopic flora and fauna of streams have been shown by the works of Weston and Turner (*1*), Forbes and Richardson (*2*), Purdy (*3*), Aggersborg and Hatfield (*4*), Kolkwitz and Marsson (*5*), Kalmus (*6*), Seeler (*7*), Roy (*8*), Marsson (*9*), Liebmann (*10*), and many others. It seems well demonstrated that a quick rise in numbers and in species of organisms follows the admission of sewage except where the discharge is such that oxygen depletion results, in which case the stream population drops. Liebmann (*11*), Wetzel (*12*), and the writer (*13*) have shown, however, that oxygen-depleted streams have different, but smaller, populations. Volk (*14*) decided that pollution failed to affect the microfauna of the Elbe at Hamburg.

The writer (*15*) is of the opinion that there is a secondary effect of sewage. The immediate effects shown above seem to us to be due largely to the primary increase in bacteria, which become food supporting a large population of holozoic organisms. There is likewise an increase of saprozoic organisms, possibly due to the immediate decomposition products of organic matter. But farther downstream there is also an effect on holophytic organisms, due in part to the increased salts content, especially phosphates and nitrates. Volk might have been dealing with such an effect when she found no drop in stream population due to sewage. At any rate, the rivers we have investigated all show a marked increase of chlorophyll-bearing organisms at a considerable distance below the entrance of sewage.

The effects of sewage and other wastes would be much more apparent if we had a comprehensive knowledge of the plankton of clean streams. Unpolluted streams have been investigated by numerous workers, among them Butcher (*16*), Fritsch (*17*), Batard (*18*), Lemmermann (*19*), Bischoff (*20*), and others. Des Cilleuls (*21*) has summarized the various findings as to what governs the appearance of given plankton species in a stream. We are beginning to have a

[1] From the Division of Public Health Methods, National Institute of Health.

definite idea, but not yet a comprehensive knowledge, of what plankton species may be found in a given stream and, to a lesser extent, their comparative abundance.

Work on the biological effects of specific trade wastes added to streams deals mostly with fish. Aggersborg and Downer (*22*) have studied the effects of starch wastes on the microscopic flora and fauna. The writer (*23*, *24*) has studied the effects of sulfuric acid from coal mines. But there are almost no other investigations to give the biological background for such wastes as phenols, paper mill wastes, and many others. This paper is an introduction to the effects of distillery wastes on a small creek.

At Lawrenceburg, Ind., large whiskey distilleries are situated on the banks of Tanner's Creek. This is a small stream, about 21 miles long, rising in the flat country of northwest Dearborn County, Ind., and flowing through a deeply eroded valley to the Ohio River. In late summer its flow is only a few cubic feet per second, but in 3 years we have never seen the flow cease. The water is clear, except following rains, and has a pH of 7.4 to 8.2. It gets no wastes to speak of until the distilleries are reached, about 3 miles from its mouth. Above the distillery it supports a varied fish population. There are numerous quiet areas where plankton can develop. It might be termed a typical, pleasant, small creek of the Ohio River drainage basin. Table 1 shows its general biochemical nature during the second 6 months of 1939.

TABLE 1.—*Biochemical features of Tanner's Creek above and below distillery*

Date 1939	Temperature		Dissolved oxygen, percent saturation		5-day B. O. D.		Bacteria per ml., agar count 24 hrs. at 37° C.		pH	
	Above	Below	Above	Below	Above	Below	Above	Below	Above	Below
July 14	24.5	30.0	70.8	0.0	1.61	43.60	2,210	10,000,000	-------	-------
July 26	24.0	27.0	77.4	.0	1.16	70.00	2,280	7,860,000	-------	-------
August 10	21.0	26.0	70.5	.0	.40	23.00	2,400	Spreaders	-------	-------
August 23	20.5	30.0	61.1	.0	1.52	47.25	21,600	8,150,000	7.4	7.5
September 20	18.0	27.0	61.1	.0	.78	162.40	7,900	23,000,000	7.5	7.1
October 18	17.5	27.0	105.1	.0	5.31	68.10	450	15,000,000	7.7	7.5
November 15	5.0	26.5	146.5	.0	3.31	114.50	710	4,300,000	7.6	7.4
December 27	1.0	30.0	106.5	.0	2.42	441.5	680	1,800,000	8.0	7.5

A few samples were taken from points in this creek in 1938 and 1939. In 1940 systematic sampling was undertaken and 96 samples were collected, many of them at weekly intervals. A few of these were taken when the stream was heavily flooded, and were discarded for that reason. For a short time also, high water in the Ohio precluded sampling, but the results of examining 84 samples are shown herein. Twenty-nine of these were obtained about 3 miles above the entrance of any distillery wastes (station A), 35 were taken about a quarter of a

mile below the lowest (station B) entrance of distillery wastes, and 20 were collected about a mile below this point (station C).

Station A may be from 3 hours to a day above station B in time of flow, but because there has always been a reasonably heavy flow between B and C, these two are separated by only a few hours at most. In all the samples collected 246 species, genera, or groups of fungi, algae, protozoa, and Rotifera were identified and their total numbers were counted. In every case 100 ml. of raw water were centrifuged and the catch saved and counted. The procedure followed has been described in a previous paper (*25*) and is believed to be accurate.

Table 2 shows the distribution of the various groups of organisms. Fifty-three species, or 22.36 percent, were each found only once in the 84 samples. Thirty-eight species, or 16.03 percent, each occurred in 2 of the 84 samples. But 155 species, or 61.61 percent, were found in 3 or more of the samples, 2.53 percent being common to 10 of the samples. Many species thus show a strong tendency to recur, and analysis and comparison of individual samples show that some organisms were found at one or more of the sampling points for weeks at a time. None of these seldom-occurring species ever flowered into great blooms. *Oicomonas* sp. numbered 280 per ml. of raw water on the single occasion when it was found, *Poteriodendron petiolatum* 120 per ml., and *Phacus anacoleus* 58 per ml. Some of the recurrent species far exceeded these numbers at times.

TABLE 2.—*Occurrence and distribution of microscopic organisms at three stations in Tanner's Creek*

Station A, above distillery, 29 samples; station B, just below distillery, 35 samples; station C, 1 mile below distillery, 20 samples

Group or class or organism	Number species found	Number of species found at:							Total occurrences of all species	Number of times species of group occurred at:						
		A only	B only	C only	All 3	A and B	A and C	B and C		A only	B only	C only	All 3	A and B	A and C	B and C
Fungi	4	1	----	----	2	----	----	1	29	3	----	----	23	----	----	3
Myxophyceae	2	1	----	----	1	----	----	----	13	1	----	----	12	----	----	----
Heterokontae	1	1	----	----	----	----	----	----	3	----	----	----	----	----	3	----
Bacillarieae	6	8	----	1	5	----	1	1	127	18	----	1	104	----	2	2
Dinoflagellata	4	2	----	----	----	----	2	----	13	5	----	----	----	----	8	----
Chrysophyceae	19	8	----	----	8	2	1	1	137	21	----	----	97	14	5	----
Cryptophyceae	6	1	----	----	2	2	----	1	81	3	----	----	60	14	----	4
Euglenophyceae	2	10	4	----	16	12	----	----	461	35	6	----	346	74	----	----
Chlorophyceae:																
Volvocales	0	9	1	1	9	6	----	4	314	31	1	1	205	32	----	43
Other	28	12	----	1	7	4	2	2	176	24	----	1	129	9	8	5
Mastigophora	19	3	3	1	6	----	1	5	163	4	3	1	107	----	2	47
Sarcodina	8	3	1	----	----	2	1	1	16	3	1	----	----	6	----	6
Infusoria	2	12	3	4	11	6	2	5	181	21	5	5	86	30	5	29
Rotifera	6	4	1	----	----	1	----	----	26	16	1	----	----	9	----	----
Total	227	76	13	8	67	35	10	20	1,740	184	17	9	1,169	188	33	139

The species found at station A also show a striking similarity to the plankton species found in other creeks and rivers of the Ohio River system, for example, the Scioto, Muskingum, Little Miami, Great Miami, White, and Wabash Rivers. In fact, only two species from this station, *Pyramidomonas reticulata* and the organism tentatively named *Lobomonas quadriciliata*, have not been found elsewhere by us. *Uroglenopsis* and *Ceratium hirundinella* have been far more common in this creek than in any other stream we have examined, but the former often constitutes a bloom in ponds or reservoirs and the latter is common to some rivers. The number of species found at station A is not as great as we have found in some other Ohio basin streams, but considering the small size of the creek it is a remarkably long list and lends support to the idea that there is a large and constant stream plankton, in some respects different from lake or pool plankton.

The species found at B and C show sharp differences from those at A. Seventy-six species were not found anywhere except at A, 13 only at B, and 8 only at C. Sixty-seven species were common to all three stations. Table 2 shows the number of times species occurred at each of the three stations. If we consider A as a clean water station and B and C as polluted water stations, the observations here are in accord with previous observations except with regard to the Rotifera which, being frequently bacteria eaters, might be expected at B and C in some abundance. Chrysophyceae and Cryptophyceae are sharply reduced at B and C, and Euglenophyceae fail to show a marked preference for pollution. Colorless flagellates, Volvocales and Infusoria, sharply predominate at the two lower stations.

There were only four fungi counted—the bacteria *Blastocaulis*, *Chromatium*, *Beggiatoa*, and *Sphaerotilus*. An attempt was made to count large spirilli and yeasts, but they were always abundant at the two lower stations and practically lacking at A. Numbers were so large that the attempt to count them was abandoned.

The predominance of some groups above and others below the distilleries is shown in table 3 and illustrates more clearly than table 2 the numerical differences in organisms above and below the sources of pollution. The average number of species per sample at A was 36.45, at B 16.80, and at C 14.80. The average number of organisms per ml. per sample at each station also emphasizes the drop in numbers. At A, 1,687 per ml. were found, at B, 1,008 per ml., and at C, 887 per ml. The consistent oxygen depletion might be an explanation of this decrease in numbers. However, many green forms as well as a variety of colorless ones can stand an oxygen depletion for a long time. The organisms peculiar to the two lower stations include

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TABLE 3.—*Station predominance and occurrence of organisms in Tanner's Creek in relation to entrance of distillery wastes*

Groups of organisms	Number of times any species of group occurred		
	Station A (Above distillery)	Station B (Just below distillery)	Station C (Mile below distillery)
Predominant above distillery:			
Heterokontae	2		1
Bacillarieae	68	37	25
Dinoflagellata	11		2
Chrysophyceae	100	26	11
Cryptophyceae	51	23	7
Euglenophyceae	255	157	49
Chlorophyceae except Volvocales	89	48	35
Rotifera	23	3	
Predominant below distillery:			
Fungi	5	16	8
Myxophyceae	3	5	5
Chlorophyceae, Volvocales	124	120	59
Mastigophora	42	84	46
Sarcodina	6	7	3
Infusoria	95	62	45

a number of these. *Bodo caudatus*, *Cercobodo* sp., *Clautriavia parva*, *Heramitus inflatus*, *Mastigamoeba* sp., *Tetramitus pyriformis*, and *Trepomonas rotans* or *agilis* are all colorless flagellates of this type and are common to the sludge compartment of Imhoff tanks or other situations where the organic content is high, oxygen is depleted, and H_2S and methane are present. In fact, the common protozoa of the lower creek are such as occur in the anaerobic digestion of domestic sewage. In addition, three species of green Volvocales are abundant, which we have never found in Imhoff tanks—*Chlamydobotrys* spp., *Chlorogonium euchlorum*, and *Chlorobrachis gracillima*. The first two are occasionally present in unpolluted waters, but we have never found *Chlamydobotrys* abundant in other than polluted water (below sewage plants, vegetable canneries) and have never before found great numbers of *Chlorogonium euchlorum*. *Chlorobrachis* was described by Korshikoff (see Pascher (*26*)) from "Bassins mit faulenden wasser" in Russia and he may have meant sewage digestion tanks. We have found no other records of its occurrence, but for 3 months at least it was present in Tanner's Creek below the distilleries, on July 7, 1940, reaching 1,360 per ml. at station B.

From the data in table 1 it appears that there are several drastic changes introduced by the distillery wastes which might affect the plankton population of the creek. Temperature of the water jumps as much as 25 degrees at times, and such sudden changes are demonstrably fatal to many micro-organisms. On July 9, 1940, the temperature increased from about 22° C. to 36° C. and only about 12 percent of the *Chlorobrachis* were alive. Nevertheless, they and 32 other species were alive and apparently thriving on July 10 at a temperature of 38° C. Although the sudden changes over such a range may

kill much of the population brought downstream by the current, yet enough are left alive so that thorough re-seeding occurs.

Oxygen depletion also may be fatal to a large number, yet many of the organisms found at B and C during the past year are most emphatically not characteristic of oxygen-deficient environments. If they are green, they are safe during daylight hours, but for most colorless organisms oxygen depletion is another of the damaging influences introduced by the distilling wastes. The measure of change is evidenced by the large number of anaerobic forms which make their appearance.

A third change is the increase in biochemical oxygen demand. How much of this increase is due to soluble organic matter, or to dead organic matter we do not know, but in addition to such materials the waste water contains large quantities of dead and living yeast cells. Laboratory experiments on the aerobic and partly anaerobic digestion of distillery wastes have shown a huge and expected development of yeasts.

A fourth change is the huge bacterial population immediately produced. Bacteria crowd algae and protozoa out of existence if too abundant because they deplete oxygen, alter pH, etc. Frequently it is evident that the numbers of bacteria in the distillery-waste laden waters approach those of organic infusions, and this high bacterial population may be another factor, induced by the distillery wastes, tending to reduce the normal stream flora and fauna.

The fifth change is chemical. Detailed analyses are not available for samples above and below the distilleries, but the changes in phosphorus are one evidence of this. Thus on September 10, 1940, the phosphate content of the creek water, in parts per million, was 0.08 at station A, 11.25 at station B, and 4.60 at station C. On October 8, 1940, the phosphate values at these three stations were, respectively, 0.06, 13.20, and 2.00 parts per million. Other data show that the phosphate (soluble phosphorus) content may jump from a few hundredths of a part per million to a thousand times that value, and that it rises to one part per million or more above the distilleries only after a rain, when the creek is high. Increasing the phosphorus content of natural waters normally increases the plankton, but in this case we must conclude that its beneficial increase is offset by other detrimental factors. Another evidence of chemical change is the evolution of methane and H_2S in the creek below the distilleries.

The nature of the changes induced in the water appears then to be unfavorable to the greater part of the plankton. Some few groups, as shown in table 3, apparently find distillery waste waters a favorable habitat. Most of these groups are comprised of organisms which favor an anaerobic habitat, or one in which the oxygen content is low, including such genera or species as *Polytoma uvella*, *Trepomonas*

agilis, *T. rotans*, *Tetramitus pyriformis*, *Hexamitus inflatus*, *Mastigamoeba*, *Bodo* and *Cercobodo*, *Enchelys vermicularis*, *Trimyema compressum*, and *Metopus*. Others are those found in waters of high organic content, as the bacteria *Chromatium*, *Beggiatoa*, and *Sphaerotilus*. One of the Cryptophyceae occurs in some numbers at the lower stations and not at A. But it is the colorless *Chilomonas paramecium* which, in contrast to other Cryptophyceae, thrives in organic infusions. The colorless Chrysomonad, *Physomonas vestita*, behaves in a similar manner. Many species of Euglenophyceae appear to be tolerant to the distillery waters, while *Euglena polymorpha* and *E. viridis* were actually more abundant at the lower stations. But at extreme low flows late in summer, when the creek was largely made up of distillery wastes, even these tolerant forms tended to disappear from the lower stations.

A similar tolerance was noted for some of the nonmotile Chlorophyceae and some of the Volvocales, such as *Eudorina elegans*, *Heteromastix angulata*, *Pandorina morum*, and *Thoracomonas phacotoides*. Very few of the diatoms were found at the lower stations, although *Melosira granulata* was most abundant at the lowest station. Of the Sarcodina, *Hartmanella hyalina*, found in small numbers at B and C, was not found at A. The commonest tolerant Ciliata at B and C were those forms common to sewage as *Chilodonella*, *Colpoda*, *Colpidium*, *Oxytricha*, and *Paramecium*.

Excluding the tolerant forms, those which are characteristic of waters with a high organic content and those characteristic of oxygen-depleted waters, only five genera of algae and protozoa have appeared persistently and in some numbers below the entering waters of the distilleries. These are the Volvocales, *Chlorobrachis gracillma*, *Chlorogonium euchlora*, and *Chlamydobotrys* spp., together with two ciliates, *Oxytricha*, probably the species *chlorelligera*, and a *Spathidium* resembling *viride*. It is noteworthy that these last two contain zoochlorellae, and might be able to furnish a part at least of their own oxygen.

It appears then that the waters and wastes from these distilleries tend to reduce the plankton content of the creek; that some plankters are tolerant, at least for a short distance, of the distillery wastes, as long as those wastes do not become too concentrated or raise the temperature too greatly; that a group of organisms favoring water of a high organic content and another favoring oxygen-depleted waters partly replaces the normal stream plankton; and that five algae and protozoa were found for some time and in relative abundance in these waste waters, although we have never encountered them in abundance elsewhere. Whether or not these last five organisms are characteristic of distillery wastes may only be anwered by a study of other streams polluted by such wastes.

low, including such genera or species as *Polytoma uvella*, *Trepomonas*

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THE RELATION OF PLANTS TO MALARIA CONTROL

With Special Reference to Impounded Waters

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In malaria control, procedures may be directed against the malaria parasite or its anopheline vector, or they may be designed to protect the human host from the bite of infected mosquitoes. Aquatic plants play a dominant role in the malarial triangle inasmuch as they provide food and shelter for the larvae of the vector. It follows, therefore, that the task of the plant scientist is to determine the relation of each species to anopheline propagation and to devise methods of reducing objectionable species to an innocuous state. The following discussion is a summary of the plant investigations carried on by the Tennessee Valley Authority during the summers of 1937 to 1940, inclusive.

RESERVOIR PREPARATION

Tolerance of trees to inundation.—It has been stated recently that "mosquito control is built into the design of our dams, into the preparation of our reservoirs, and into the operation of our lakes"(*1*). Since vegetation is the cornerstone of mosquito propagation, it is obvious that plant control is of paramount importance in the above operations. In reservoir preparation it has been considered axiomatic that complete clearing is absolutely essential to reasonable mosquito control after impoundage. However, it has been discovered that certain trees just above normal pool level are killed by the increased water elevation in new impoundments. An investigation on the effect of impoundage on trees was initiated in 1937 and completed in 1939. Studies have been made in two limesinks, in two ponds whose water level was raised by the Wheeler impoundment, and in three of the reservoirs of the Authority. The data taken included height of the tree or its sprouts, health of the plant, the depth of the water, and the duration of the hydroperiod. Approximately 2,000 observations were made during the summers of 1937 and 1938. This investigation resulted in the delineation of trees into three classes of tolerance—tolerant, moderately tolerant, and intolerant. The tolerant class includes those trees which thrive for two or more growing seasons in water which averages one foot or more in depth. The moderately tolerant species do not survive the above conditions for as long as two growing seasons, and the intolerant trees succumb in less than one growing season, usually in less than two months.

The tolerant group includes not only aquatic trees but also several floodplain species and one upland species (persimmon). The moderately tolerant class comprises both bottomland and upland species,

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including the loblolly pine. Even the intolerant group includes some species which thrive in flood plains but which are very intolerant of summertime flooding. Notable among these are black walnut, American beech, yellow poplar, white oak, and sugar maple. On the basis of these studies it has been agreed that no clearing of tolerant and moderately tolerant trees should be carried out above the maximum summertime pool elevation. On the other hand, it has been recommended that all intolerant species be removed for some distance above the maximum pool level since dead trees or their parts constitute a mosquito hazard when they fall into the reservoir. These species, in order of decreasing tolerance to flooding, are as follows: White ash, chestnut oak, mockernut hickory, shagbark hickory, ironwood, black locust, sassafras, flowering dogwood, sourwood, southern red oak, Spanish oak, blackjack oak, Schneck's oak, wild black cherry, shortleaf pine, scrub pine, red cedar, redbud, black walnut, American beech, yellow poplar, white oak, sugar maple, and post oak.

Growth of coppice.—The clearing of a reservoir usually occupies a period of two or three years. During this period, or any considerable portion thereof, the stumps in the marginal area produce new shoots of such a height as to create a major malaria hazard subsequent to closure of the dam. Observations on the growth of coppice were first made in the Pickwick Reservoir in the autumn of 1937. In the same year, opportunities were afforded in the Wheeler Reservoir to determine the effect of flooding and rebrushing on coppice growth. In addition, a detailed investigation, involving over 5,000 measurements, was conducted in the Guntersville Reservoir from March 1 to October 15, 1938. Monthly measurements were made on coppice in areas cleared at monthly intervals and information was obtained on the effect of log-burning on coppice production and on the seasonal march of growth in the various species. As a general rule, only about 60 percent of all the stumps produced coppice, due, to some extent, to the burning of logs on the area, but mainly to the fact that stumps over twelve inches in diameter produced few or no sprouts. The growth of shoots was initiated as early as March 15, was greatest in early spring, decreased gradually throughout the growing season, and ceased by October 15. The average growth for all species was about 0.33 inches per day. The growth rate was greatest in the tolerant group, and considerably lower in the semitolerant and intolerant species. These facts have enabled the personnel charged with reservoir clearance to predict the height of the coppice just before closure and to set the time for rebrushing operations at the various elevations in such a sequence as to prevent a mosquito hazard after impoundage.

Poisoning of willow stumps.—Among the tolerant trees, the black willow grows so fast and survives inundation so well that it has been

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subjected to routine stump poisoning. As a general practice, the stumps are thoroughly frilled (hack-girdled) and a plant poison is poured or sprayed into the trough produced. Sodium arsenite in dilute solution gave excellent results but presented such a hazard to man and livestock as to demand a less toxic arboricide. Of twenty arboricides tested, several have proved satisfactory. These are larvicidal oil, coal tar oil, kerosene, four fuel oils, two phenolic compounds, and sodium chlorate. It should be pointed out that the preparation of the stump is more important than the arboricide utilized. This is confirmed by the fact that it is virtually impossible to poison stumps which are too small to frill properly.

Shoreline clearing.—The final procedure in reservoir preparation is a thorough cleaning of the shoreline, especially in the zone of fluctuation. In the beginning, the plants, or dead plant parts, were cut, raked, piled, and burned by hand. At present, however, as much of this work as possible is being done by mowing machines and hayrakes, drawn by horses or tractors. This has necessitated low cutting of stumps in the area treated. This practice has the added advantage of reducing the amount of coppice from stumps and it is hoped that the poisoning of willow stumps will be obviated thereby.

RESERVOIR MAINTENANCE

Control of coppice.—In a reservoir that has been thoroughly prepared, the shoreline will be nearly devoid of dead plants or their parts and excellent mosquito control may be expected during the first growing season if the stranding of drift and flotage has been adequate. The maintenance of a clean water surface is difficult, however, because of the production of coppice and colonization by aquatic plants. Although stumps never produce coppice when continuously submerged, many species produce abundant shoots if dewatered even as late as the middle of the growing season. Fortunately, the stumps of intolerant trees do not produce sprouts when inundated for extended periods. Furthermore, stumps produce fewer and smaller sprouts in deeper water. These facts suggest that trees should be cut as close to the ground as possible in order to destroy a maximum number of stumps and to decrease the growth rate of coppice on the remainder. In certain areas of our reservoirs it has been necessary to resort to rebrushing to obtain satisfactory mosquito control. A comparison of shoots on rebrushed stumps with those produced immediately after clearing revealed about a 25 percent lower growth rate. Furthermore, a second rebrushing reduced the growth rate by another 25 percent. Such a rebrushing operation, including the cutting, piling, and burning of coppice and herbaceous growth, can be executed most economically by mowing machines and

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hay-rakes. Approximately 0.15 machine day is required per acre. Where the operation is carried out manually 2.5 man days (8-hour day) per acre are required. It has been observed, however, that rebrushing alone will never eliminate coppice completely. On the other hand, grazing animals have been observed to reduce large stands of coppice to the vanishing point. It is possible, therefore, that grazing animals may be of value in the control of anopheline mosquitoes by reducing the vegetative cover along our shorelines.

Herbaceous plants important in anopheline breeding.—As compared with coppice, wetland and aquatic herbaceous plants present a much more serious mosquito control problem. Hinman (*2*) states: "*Anopheles quadrimaculatus* breed almost exclusively in aquatic and semi-aquatic vegetation or in flotage (fine drift composed mostly of vegetable debris). If these two sources of protection to the larvae could be removed or controlled, our problems of malaria control in the Southeastern States would be practically solved." The wetland (semi-aquatic) species are important in the breeding of anopheline species only when the reservoir level is near, at, or above the summertime elevation. The most important of these species are purple grass, *Panicum agrostoides*; saw grass, *Homalocenchrus oryzoides*; hop sedge, *Carex lupulina*; weak rush, *Juncus effusus*; and the spike rush, *Eleocharis obtusa*. The emergent aquatics include plants with erect, leafy stems, such as the willow-weed, *Dianthera americana*, and the lizard's tail, *Saururus cernuus*. Another group of emergents are plants with both horizontal and erect leafy stems. In this category the alligator grass, *Achyranthes philoxeroides*, and the water purslane, *Isnardia palustris*, are the most troublesome. In the third type of emergent aquatics, rhizomes produce leaves which either lie on the water surface or are projected above it. In this group the cow-lily, *Nymphaea advena*, and the lotus, *Nelumbo lutea*, are proving to be two of our greatest problems. Of the submerged aquatics, the most widespread species among which anopheline larvae have been found are the hornwort, *Ceratophyllum demersum*, and the water milfoil, *Myriophyllum pinnatum*. During the summer of 1941 a detailed study was inaugurated on the relation between plant species and anopheline breeding.

Colonization by aquatic plants.—Although a new impoundment greatly increases the potential habitat of the above-mentioned species, there are relatively few sources of migrules. An opportunity is thus afforded to prevent the colonization of obnoxious species in new reservoirs or portions thereof. Our observations show that the colonization of certain aquatic plants has been phenomenal (*3*). Alligator grass was first noted in Lake Wilson in 1933, but had reached practically all parts of the reservoir by 1938. It was discovered in the Elk River Basin of the Wheeler Reservoir in the autumn of 1938 and was

observed for the first time in the upper part of Pickwick Reservoir in the autumn of 1939. At the present time, several hundred patches of this obnoxious weed have been spotted in each of these reservoirs. The elimination of this species from Wheeler and Pickwick Reservoirs is considered necessary, but much thought, time, and money will be required to carry out this difficult task. The colonization rate of lotus is even more phenomenal, but space precludes a discussion of our observations on this species. The above discussion should be sufficient, however, to indicate that an annual shoreline survey is imperative. In this survey location and extent of obnoxious plants are indicated in color on maps selected by the sanitary engineer. In addition, such other operations as drift removal, erosion clearing, marginal drainage, and rebrushing are added by the resident engineers.

Fluctuation and colonization.—In connection with the studies by Hinman (*2*), a considerable number of observations have been made on the effect of cyclical fluctuation and seasonal recession on the colonization of plants. In general, it may be said that cyclical fluctuation has little effect on the growth of plants except that most submerged aquatics are killed and a slight extension of emergent aquatics is occasioned. It is probable, however, that a wide fluctuation is unfavorable to the ecesis of any aquatic plants. Regarding the effect of seasonal recession, all submerged species are eliminated from the dewatered zone, although recolonization is attempted annually. The emergent species, however, extend farther lakeward each year until a maximum extension is attained. Terrestrial species, also, invade the dewatered zone but are killed by the subsequent progression of water level. Observations in certain other reservoirs with a wide recession zone indicate that the ecesis of submerged aquatics and of most emergent species is prevented. A considerable flood surcharge may be conducive to the rapid colonization of certain aquatic plants, a notable example being the spread of alligator grass in Pickwick Reservoir.

Methods of plant control.—The methods of control of herbaceous plants are still in process of evolution. The present methodology includes removal, recurrent cutting and herbicides. Removal by digging, raking, pulling, or by a dragline is successful only when all the vegetative parts are taken out and properly disposed of. Digging has been utilized successfully on the giant cut grass but has not been effective with the willow-weed. Pulling has proved an effective means of removing cattail and raking has been successful in the control of the water-shield. Removal by a dragline has proved a failure in the case of the willow-weed and is not to be recommended for other obnoxious species.

The other mechanical means of control is that of periodic and recurrent cutting. Experiments on the lotus and cow-lily indicate that it is comparatively easy to destroy these species in the relatively turbid water of most of our reservoirs, especially where the water is more than two feet deep. It is necessary only to cut off the leaf blades, usually just below the water surface, at intervals of three weeks until the plants are eliminated. The flotage produced has not proved a problem since most of it is stranded on the shore and the remainder sinks to the bottom in four to seven days. An interval of three weeks between cuttings is selected since by this time the new leaves have come to the surface and anopheline breeding may have begun. Since the cost of cutting by motorized equipment is very low, it is probable that this method may be used as an antilarval measure in situations where eradication is impossible. Experience on the Wheeler Reservoir with a Hockney underwater weed cutter has demonstrated that one machine with one operator and one tender can cut approximately 5 acres per day. It should be emphasized that early discovery of small colonies and thorough treatment is necessary if mechanical control is to be successful.

Herbicidal investigations in our reservoirs have revealed much of interest and promise in plant control. In the growing seasons of 1936 and 1937 large scale experiments were carried on to determine the effectiveness of sodium arsenite on the willow-weed. It was found that a given amount of sodium arsenite assiduously applied as a weak solution (3 percent) to a given area gave better results than when applied in a concentrated solution. Powdered sodium arsenite on wet soil, or in water in which the plants were growing, destroyed plants effectively. It was from this fact that the idea of airplane application of herbicides was derived. Calcium arsenite, applied by airplane at rates of 50 and 250 pounds per acre, destroyed nearly all the leaves on all plants and killed most of the coppice to the ground line. Although considerable resprouting occurred, the success of the experiment was remarkable in view of the low solubility of calcium arsenite. An experiment designed to test the possibility of using small amounts of calcium arsenite as a larvicide-herbicide proved unsuccessful. On the other hand, monthly applications of sodium arsenite at the rate of 8 pounds per acre have reduced the vegetative cover from about 75 percent to less than 25 percent and have completely destroyed much of the coppice in the area treated. It is probable that this method might be utilized in large areas, especially as an adjunct in opening up the vegetative cover for effective larvicidal dusting.

Despite the demonstrated effectiveness of sodium arsenite as an herbicide, a concerted attempt is being made to develop herbicides which are less toxic to man and domestic animals. During the current

season, ten herbicides have been tested in some detail and five have demonstrated considerable promise as liquid herbicides. These include an emulsion of sodium arsenite and fuel oil, two fuel oils, and two phenolic compounds. What is needed next is a powdered herbicide which can be applied by airplane and which is relatively nontoxic to man and livestock. Herbicides hold considerable promise for the future, especially where they can be utilized at low rates of application to check plant growth and thereby restrict anopheline breeding.

SUMMARY

The main objective of the biological investigations has been to obtain mosquito control through proper reservoir preparation and adequate reservoir maintenance with constantly diminishing reliance on larvicides. In the field of reservoir preparation, it has been possible to delineate trees on the basis of their ability to withstand flooding and thus to remove the intolerant species before impoundment. The determination of the seasonal growth of coppice has enabled the personnel charged with reservoir clearance to set the time for rebrushing operations in order to prevent a mosquito hazard subsequent to closure of the dam. The technique of willow stump poisoning has been improved and less toxic arboricides have been tested. These, and other biological researches on reservoir preparation, have yielded significant dividends in lowered maintenance costs.

The rigid control of obnoxious shoreline vegetation is almost synonymous with adequate reservoir maintenance. The fact that coppice does not grow from completely inundated stumps and grows slowly when a considerable portion of the stump is immersed has led to the practice of low cutting of stumps. Rebrushing has been shown to decrease the growth rate of coppice and heavy grazing has been observed to eliminate coppice completely. Herbaceous plants present a much more serious mosquito control problem. To date, the worst offenders have been delineated and are being subjected to detailed life history studies. The rates of colonization are also being determined, especially in relation to the fluctuation schedules being employed. At present the methods of plant control involve removal, recurrent cutting, and the application of herbicides. Of the three methods, recurrent cutting has yielded the greatest returns but is applicable only to cow-lily and lotus. Of the liquid herbicides, sodium arsenite has proved most effective, but five other less toxic plant poisons have demonstrated considerable promise. Airplane application of powdered herbicides has proved successful in opening up vegetation for more effective antilarval measures and possibly may be utilized to reduce plant growth sufficiently to obviate the use of larvicides.

On the basis of our experience, the following suggestions are offered. Complete clearing to the maximum summertime pool level and a thorough autumn clean-up just preceding wintertime impoundment is prerequisite to effective mosquito control during the first two or three seasons in the life of a reservoir. Fundamental to adequate reservoir maintenance is the delineation and investigation of the most important obnoxious plants. As soon as this is done an intensive campaign to prevent or to limit the colonization of certain critical species should be undertaken. It should be pointed out that early discovery, proper treatment, and continuing vigilance are all important in such a program and that the field personnel should be thoroughly schooled in the various aspects of the problem. If it is impractical to prevent colonization, as may be the case with native species of wide distribution, attenuation by herbicides should be employed.

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PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

January 4–31, 1942 [1]

The accompanying table summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State are published in the Public Health Reports under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4-week period ended January 31, 1942, the number reported for the corresponding period in 1941, and the median number for the years 1937–41.

DISEASES ABOVE MEDIAN PREVALENCE

Meningococcus meningitis.—For the 4 weeks ended January 31 there were reported 230 cases of meningococcus meningitis as compared with 163, 129, and 212 cases for the corresponding period in 1941, 1940, and 1939. An increase of this disease is normally expected at this season of the year, but the current figure is the highest for this

[1] The data contained in these reports are based upon thirteen 4-week periods with the first week in each year ending between the 4th and the 10th of January. This of necessity makes an extra week in an occasional year over a period of years as was the case in 1941. The first week used in the current 4-week period ended January 10, that being the first 7-day week in 1942.

period in 4 years. The States having the highest number of cases were widely scattered, viz, New York, 25 cases; California, 19; Maryland and Texas, 18 each; Pennsylvania, 16; Virginia, 14; Massachusetts, 12; and Ohio, 8 cases. No other State reported more than 5 cases.

Poliomyelitis.—During the 4-week period there were 109 cases of poliomyelitis reported, which was only about 75 percent of the number reported in 1941 but about 10 percent above the seasonal average for this period. The incidence in the North Atlantic regions was still considerably above the normal seasonal incidence, while other regions either closely approximated the 1937–41 median figures or fell below them. Since the North Atlantic regions were the last affected by the recent rise of this disease, the decline to the normal level would naturally be later there; further declines may be expected in all sections of the country as the lowest incidence is usually reached during April and May.

Whooping cough.—Whooping cough was slightly more prevalent than it was during this period in 1941 and also about 20 percent above the 1938–41 average seasonal incidence. In 6 of the 9 geographic regions the number of cases was higher than the normal seasonal expectancy and in 3 of them it was lower. For the country as a whole the reported cases totaled approximately 17,000, which was the highest incidence for this period in 3 years.

DISEASES BELOW MEDIAN PREVALENCE

Diphtheria.—For the 4 weeks ended January 31, the number of reported cases (1,481) of diphtheria was more than 20 percent in excess of the number recorded for the corresponding period in 1941, but it was only about 60 percent of the 1937–41 median incidence for this period. All regions except the Middle Atlantic, West North Central, and Pacific reported excesses over the 1941 figures for this period. In all regions, however, the number of cases was below the 1937–41 median incidence, very significant decreases being reported from the East North Central and South Atlantic regions.

Influenza.—For the current period there were 16,925 cases of influenza reported, as compared with approximately 384,000, 52,000, and 13,000 cases for the corresponding period in 1941, 1940, and 1939, respectively. The highest incidence is still confined to the South Central and South Atlantic regions. Of the total number of cases, Texas reported 6,319, South Carolina, 2,267, Alabama, 1,535, Virginia, 1,448, Arkansas, 857, and Oklahoma, 614 cases. More than three-fourths of the total cases were reported from those 6 States. For the country as a whole the incidence was less than 5 percent of that recorded for the corresponding period in 1941 and less than 35

percent of the seasonal expectancy. While the incidence was high in the States mentioned, in no section of the country was the incidence as high as the 1937–41 average incidence for this period.

Number of reported cases of 9 communicable diseases in the United States during the 4-week period Jan. 4–31, 1942, the number for the corresponding period in 1941, and the median number of cases reported for the corresponding period, 1937–41

Division	Current period	1941	5-year median	Current period	1941	5-year median	Current period	1941	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	1,481	1,220	2,489	16,925	383,630	51,859	36,328	40,418	36,655
New England	28	9	50	21	10,051	124	2,720	2,030	2,583
Middle Atlantic	174	180	360	97	1,430	362	7,049	17,959	5,143
East North Central	233	179	441	480	10,012	4,595	2,650	13,144	13,144
West North Central	94	131	138	176	12,169	1,079	3,187	1,473	1,976
South Atlantic	314	250	487	4,497	114,502	7,313	6,712	2,171	2,776
East South Central	147	109	174	1,900	52,709	4,488	606	1,149	900
West South Central	357	232	377	7,835	147,509	10,968	4,912	524	989
Mountain	65	58	73	1,181	21,699	2,383	2,161	1,061	1,390
Pacific	69	72	143	738	13,549	2,143	6,331	908	908
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	230	163	212	109	143	100	13,722	12,674	20,581
New England	23	10	10	7	1	1	1,434	779	1,134
Middle Atlantic	49	29	47	21	23	8	3,094	3,314	4,190
East North Central	21	18	22	21	60	16	4,134	4,229	7,710
West North Central	11	8	13	9	17	10	1,491	1,260	2,593
South Atlantic	53	34	46	10	28	18	1,275	1,111	1,150
East South Central	19	22	36	10	11	11	783	688	629
West South Central	24	22	22	11	11	11	391	352	533
Mountain	7	4	17	7	7	3	467	342	631
Pacific	23	16	16	13	12	14	653	599	1,398
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	61	190	1,144	315	312	458	17,374	16,857	[3] 15,159
New England	0	0	0	21	9	17	2,266	1,551	1,588
Middle Atlantic	0	0	0	41	42	57	4,667	4,481	4,379
East North Central	13	64	194	34	46	45	4,427	3,647	3,197
West North Central	26	76	450	10	28	28	756	947	817
South Atlantic	1	3	8	84	48	87	2,082	2,695	2,160
East South Central	2	5	6	26	26	30	501	466	381
West South Central	11	9	47	70	66	101	482	868	660
Mountain	5	25	128	9	22	24	743	560	641
Pacific	3	8	120	20	25	25	1,450	1,642	1,335

[1] Mississippi, New York, and Pennsylvania excluded; New York City included.
[2] Mississippi excluded.
[3] 4-year (1938–41) average.

Measles.—The incidence of measles was also relatively low, 36,328 cases being reported, as compared with 40,418 during the corresponding period in 1941 and an average of 36,665 cases in the years 1937–41. A very significant decline in the number of cases was reported from the East North Central region, with a minor decline in the East South Central region, but all other regions reported a relatively high incidence. The highest incidence was reported from the Middle Atlantic, South Atlantic, West South Central, and Pacific regions.

Scarlet fever.—The number of reported cases (13,722) of scarlet fever was approximately 1,000 more than was reported for this period in 1941, but the number represents a decline of more than 30 percent from the average seasonal incidence. A few more cases than might normally be expected occurred in the New England, South Atlantic, and East South Central regions, but in other regions the incidence was relatively low.

Smallpox.—The total of 61 cases of smallpox reported was the lowest on record for this period. The situation was favorable in all sections of the country. A peak of approximately 6,500 cases of smallpox was reached during this period in 1930, followed by a decline to approximately 500 cases in 1934. In 1935 an upward turn began and a lower peak of 2,435 cases was reported during the period corresponding to the current one; this has been followed by a steady decline to the current figure.

Typhoid fever.—While the incidence of typhoid fever stood at about the 1941 level, the number of cases (315) was only about 70 percent of the 1937–41 average incidence. The New England region alone reported an excess of cases over the expected seasonal incidence.

MORTALITY, ALL CAUSES

The average mortality rate from all causes in large cities for the 4 weeks ended January 31, based on data received from the Bureau of the Census, was 13.0 per 1,000 population (annual basis). The rate for the corresponding period in 1941 was 13.6 and the average rate for the years 1939–41 was 13.3. During the first 2 weeks of the period under consideration the rate was slightly higher than in 1941, but for the last 2 weeks the rates were 12.7 and 12.4, respectively, compared with 13.5 and 13.9 for the corresponding periods in 1941. The high rates of last year were due, in part at least, to the high incidence of influenza all over the country. While a few States have reported a large number of cases of influenza this year, it has apparently been a very mild form, as reflected in the death rates.

PROVISIONAL MORTALITY RATES FOR THE FIRST 9 MONTHS OF 1941—MATERNAL MORTALITY RATES—A CORRECTION

In the table showing the provisional mortality rates for certain causes during the first 9 months of 1941 and two prior years (Public Health Reports for February 6, 1942, page 199), the maternal mortality rates were incorrect. The correct rates are as follows: January–September 1941, 3.1; 1940, 3.7; 1939, 3.9; January–March 1941,

3.1; 1940, 4.1; 1939, 4.2; April–June 1941, 3.3; 1940, 3.9; 1939, 3.9; July–September 1941, 3.0; 1940, 3.3; 1939, 3.5.

The error was due to the use of the incorrect number of births in the original computation.

DEATHS DURING WEEK ENDED FEBRUARY 7, 1942

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Feb. 7, 1942	Corresponding week, 1941
Data from 88 large cities of the United States:		
Total deaths	8,879	10,229
Average for 3 prior years	9,988	
Total deaths, first 5 weeks of year	46,621	50,338
Deaths per 1,000 population, first 5 weeks of year, annual rate	13.0	14.1
Deaths under 1 year of age	533	528
Average for 3 prior years	548	
Deaths under 1 year of age, first 5 weeks of year	2,824	2,766
Data from industrial insurance companies:		
Policies in force	64,898,360	64,686,023
Number of death claims	13,086	13,835
Death claims per 1,000 policies in force, annual rate	10.5	11.2
Death claims per 1,000 policies, first 5 weeks of year, annual rate	10.4	11.2

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED FEBRUARY 14, 1942

Summary

Of the important communicable diseases for which weekly records for prior years are available, only measles, typhoid fever, and whooping cough were above the 5-year (1937–41) median incidence. A total of 93 cases of typhoid fever were reported, as compared with 43 and 64 cases, respectively, for the corresponding weeks of 1941 and 1940, and with a 5-year median of 87 cases. Georgia reported 28 cases and New York 9, with the remainder scattering.

The number of reported cases of influenza declined. A total of 5,180 cases was reported as compared with 5,667 for the preceding week. Texas reported 1,818 cases, South Carolina 784, Alabama 659, and Virginia 385. Only two other States—Arkansas and Wyoming—reported more than 200 cases. Measles (14,062 cases) continues slightly above the median (12,954) but below last year's figure (18,308) for the corresponding week.

The incidence of poliomyelitis declined from 29 to 16 cases, and meningococcus meningitis decreased from 60 to 42. Both diseases are below the 5-year median expectancy. Only 13 cases of smallpox were reported, as compared with 17 for the preceding week and a 5-year median of 371 cases.

Two cases of anthrax were reported in Pennsylvania, and 2 cases of leprosy, 1 each in Indiana and Louisiana. Of 67 cases of bacillary dysentery, 29 occurred in Texas and 19 in New York. Other reports include 19 cases of tularemia, 46 cases of endemic typhus fever, and 1 case of trichinosis (in Maryland).

The crude death rate for the current week for 88 large cities in the United States is 12.5 per 1,000 population, as compared with 12.4 for the preceding week and a 3-year average of 13.7.

Telegraphic morbidity reports from State health officers for the week ended February 14, 1942, and comparison with corresponding week of 1941 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none were reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1937–41	Week ended—		Median 1937–41	Week ended—		Median 1937–41	Week ended—		Median 1937–41
	Feb. 14, 1942	Feb. 15, 1941		Feb. 14, 1942	Feb. 15, 1941		Feb. 14, 1942	Feb. 15, 1941		Feb. 14, 1942	Feb. 15, 1941	
NEW ENG.												
Maine	0	0	3	-------	112	11	264	122	122	3	0	0
New Hampshire	0	0	0	-------	------•	-------	15	4	44	1	0	0
Vermont	1	0	0	-------	-------	-------	3	29	27	0	1	0
Massachusetts	3	2	2	-------	-------	-------	430	454	454	0	2	2
Rhode Island	0	1	1	-------	1	-------	82	0	13	0	0	0
Connecticut	0	0	1	8	90	26	169	84	108	1	0	0
MID. ATL.												
New York	26	15	30	[1] 14	[1] 182	[1] 50	404	3,375	673	3	10	6
New Jersey	4	7	12	22	704	54	167	1,076	464	2	0	0
Pennsylvania	14	20	35	-------	-------	-------	1,083	3,189	170	5	4	7
E. NO. CEN.												
Ohio	13	2	20	16	272	202	222	395	46	1	0	3
Indiana	10	12	17	44	113	113	57	222	14	2	2	2
Illinois	15	18	32	23	127	128	230	1,995	37	0	1	1
Michigan [2]	3	5	12	1	120	24	173	1,965	323	1	1	1
Wisconsin	2	1	1	44	731	112	328	769	708	1	0	0
W. NO. CEN.												
Minnesota	1	5	3	-------	240	4	570	10	20	0	0	1
Iowa	2	7	7	9	321	86	102	162	154	0	0	0
Missouri	2	5	10	6	38	59	85	86	15	3	1	1
North Dakota	4	3	1	32	113	20	134	6	6	0	1	1
South Dakota	4	0	0	-------	9	9	16	31	2	0	0	0
Nebraska	1	4	4	2	8	-------	41	1	21	0	0	0
Kansas	6	3	11	7	105	32	291	230	230	0	0	1
SO. ATL.												
Delaware	1	0	1	-------	-------	-------	0	110	24	0	0	0
Maryland [2]	6	7	9	22	349	131	462	60	60	2	4	3
Dist. of Col	4	0	5	2	37	19	19	31	21	0	0	0
Virginia	10	6	19	385	4,018	553	148	1,060	163	0	2	4
West Virginia	5	5	7	43	294	294	641	112	23	0	3	3
North Carolina	15	12	20	16	529	115	1,171	257	257	2	0	2
South Carolina	6	2	8	784	2,217	1,041	151	64	32	2	0	1
Georgia	16	4	11	152	919	486	374	248	248	1	1	1
Florida	9	4	5	3	220	5	161	58	58	0	0	0
E. SO. CEN.												
Kentucky	1	4	6	10	396	136	48	599	108	0	2	3
Tennessee	6	13	13	63	533	533	55	155	155	2	7	4
Alabama	6	7	7	659	1,698	920	198	140	148	1	3	3
Mississippi [2]	3	5	6	-------	-------	-------	-------	-------	-------	0	0	1
W. SO. CEN.												
Arkansas	6	8	8	[3] 293	1,453	1,048	[3] 270	38	38	1	0	2
Louisiana	3	4	6	23	168	168	112	8	3	0	0	1
Oklahoma	4	4	4	100	395	395	321	7	15	2	0	1
Texas	62	31	41	1,818	1,910	1,910	2,025	463	304	1	2	3
MOUNTAIN												
Montana	6	6	3	14	51	42	96	6	7	0	0	0
Idaho	0	0	0	-------	93	5	37	8	26	0	0	0
Wyoming	0	0	1	227	103	-------	62	20	20	1	0	0
Colorado	9	12	12	29	78	27	128	106	61	0	0	0
New Mexico	1	6	3	1	94	9	55	136	51	0	1	0
Arizona	0	5	5	153	211	211	151	0	7	0	0	1
Utah [2]	0	2	0	-------	114	10	44	31	81	0	0	0
Nevada	0	0	-------	-------	-------	-------	15	2	-------	0	0	------
PACIFIC												
Washington	1	5	2	-------	21	4	41	93	93	0	0	1
Oregon	1	1	1	18	37	70	94	193	34	0	1	0
California	13	20	24	137	1,239	771	2,317	98	185	4	0	1
Total	305	283	450	5,180	20,463	16,557	14,062	18,308	12,954	42	49	69
6 weeks	2,109	1,820	3,518	27,772	407,785	89,107	64,741	82,009	61,192	332	295	323

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended February 14, 1942, and comparison with corresponding week of 1941 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever		
	Week ended—		Median 1937–41	Week ended—		Median 1937–41	Week ended—		Median 1937–41	Week ended—		Median 1937–41
	Feb. 14, 1942	Feb. 15, 1941		Feb. 14, 1942	Feb. 15, 1941		Feb. 14, 1942	Feb. 15, 1941		Feb. 14, 1942	Feb. 15, 1941	
NEW ENG.												
Maine	0	0	0	31	7	25	0	0	0	0	0	0
New Hampshire	0	0	0	13	4	7	0	0	0	0	0	0
Vermont	0	0	0	6	14	14	0	0	0	0	0	0
Massachusetts	0	0	0	374	125	235	0	0	0	0	0	1
Rhode Island	0	1	0	8	3	11	0	0	0	0	0	0
Connecticut	2	0	0	48	48	97	0	0	0	0	0	0
MID. ATL.												
New York	2	3	1	388	409	690	0	0	0	9	2	2
New Jersey	1	0	0	147	275	172	0	0	0	0	1	1
Pennsylvania	0	0	0	367	320	320	0	0	0	5	2	4
E. NO. CEN.												
Ohio	0	0	0	306	90	419	0	0	1	4	2	1
Indiana	0	0	0	160	179	188	0	1	2	2	3	3
Illinois	0	2	1	231	445	524	0	7	7	2	2	3
Michigan [3]	1	1	1	253	182	497	0	3	3	1	0	2
Wisconsin	1	2	0	208	115	206	0	4	4	3	0	0
W. NO. CEN.												
Minnesota	0	1	1	93	51	136	0	8	8	0	0	0
Iowa	0	1	1	49	75	161	1	1	33	0	0	1
Missouri	0	0	0	62	87	100	2	2	13	4	1	1
North Dakota	0	0	0	27	26	21	0	0	1	0	0	1
South Dakota	0	0	0	35	21	23	0	0	3	0	0	0
Nebraska	0	0	0	32	27	36	0	0	2	0	0	0
Kansas	0	2	0	98	79	179	0	6	6	0	1	1
SO. ATL.												
Delaware	0	0	0	65	16	16	0	0	0	0	0	0
Maryland [2]	0	1	0	88	73	65	0	0	0	0	3	0
Dist. of Col.	0	0	0	12	7	17	0	0	0	1	0	0
Virginia	0	0	0	46	35	35	0	0	0	1	1	2
West Virginia	0	0	0	37	37	50	0	0	0	2	0	2
North Carolina	0	2	0	42	41	55	0	0	0	1	1	1
South Carolina	0	0	0	6	16	8	0	0	0	2	0	2
Georgia	0	2	0	27	21	18	0	0	0	28	4	3
Florida	0	1	1	17	7	10	0	0	0	5	2	2
E. SO CEN.												
Kentucky	0	2	2	78	90	68	0	0	1	0	0	1
Tennessee	3	1	1	42	91	54	0	2	2	3	5	3
Alabama	1	0	1	24	14	16	0	0	0	0	0	1
Mississippi [3]	0	0	1	4	5	6	2	0	1	1	3	1
W. SO. CEN.												
Arkansas	0	2	1	6	27	15	1	0	1	2	1	1
Louisiana	1	0	0	4	11	10	0	0	0	4	1	5
Oklahoma	0	0	0	26	30	30	0	0	1	1	0	3
Texas	1	2	2	58	41	89	6	1	5	6	4	7
MOUNTAIN												
Montana	0	0	0	28	45	34	0	0	0	0	0	1
Idaho	0	0	0	2	14	14	0	0	1	0	0	0
Wyoming	0	0	0	20	8	9	0	1	1	0	0	0
Colorado	0	0	0	32	26	42	0	2	5	0	2	0
New Mexico	0	0	0	8	5	21	0	0	0	1	0	3
Arizona	0	0	0	14	5	5	0	0	0	0	0	0
Utah [3]	0	1	0	57	13	16	0	0	0	0	0	0
Nevada	0	0	-----	0	0	-----	0	0	-----	0	0	-----
PACIFIC												
Washington	0	0	0	45	18	61	0	0	2	1	0	1
Oregon	0	0	0	11	17	20	0	0	2	0	0	1
California	3	3	2	92	142	171	1	0	• 11	4	2	4
Total	16	30	20	3,827	3,437	5,620	13	38	371	93	43	87
6 weeks	154	179	141	21,872	20,210	31,802	97	302	1,828	493	414	661

See footnotes at end of table.

Telegraphic morbidity reports from State health officers for the week ended February 14, 1942—Con.

Division and State	Whooping cough		Week ended Feb. 14, 1942								
	Week ended—		Anthrax	Dysentery			Encephalitis, infectious	Leprosy	Rocky Mt. spotted fever	Tularemia	Typhus fever
	Feb. 14, 1942	Feb. 15, 1941		Amebic	Bacillary	Unspecified					
NEW ENG.											
Maine	37	9	0	0	0	0	0	0	0	0	0
New Hampshire	28	3	0	0	0	0	0	0	0	0	0
Vermont	53	7	0	0	0	0	0	0	0	0	0
Massachusetts	220	244	0	0	1	0	0	0	0	0	0
Rhode Island	44	8	0	0	0	0	0	0	0	0	0
Connecticut	113	56	0	0	1	0	0	0	0	0	0
MID. ATL.											
New York	417	332	0	1	19	0	0	0	0	0	0
New Jersey	195	105	0	4	0	0	0	0	0	0	0
Pennsylvania	214	96	2	0	0	0	0	0	0	0	0
E. NO. CEN.											
Ohio	240	158	0	0	1	0	1	0	0	1	0
Indiana	65	38	0	0	0	0	0	1	0	0	0
Illinois	158	106	0	0	0	0	1	0	0	3	0
Michigan [2]	192	254	0	0	0	0	0	0	0	0	0
Wisconsin	232	98	0	0	0	0	0	0	0	0	0
W. NO. CEN.											
Minnesota	53	43	0	1	0	0	0	0	0	0	0
Iowa	24	30	0	0	0	0	0	0	0	0	0
Missouri	28	28	0	0	0	0	0	0	0	0	0
North Dakota	13	7	0	0	0	0	0	0	0	1	0
South Dakota	11	19	0	0	0	0	0	0	0	0	0
Nebraska	17	4	0	0	0	0	0	0	0	0	0
Kansas	55	152	0	0	0	0	0	0	0	0	0
SO. ATL.											
Delaware	1	17	0	0	0	0	0	0	0	0	0
Maryland [2]	53	102	0	0	0	1	1	0	0	0	0
Dist. of Col	38	10	0	0	0	0	0	0	0	0	0
Virginia	70	148	0	0	0	14	0	0	0	1	0
West Virginia	41	34	0	0	0	0	0	0	0	0	0
North Carolina	148	271	0	0	0	0	0	0	0	0	3
South Carolina	45	78	0	0	0	0	0	0	0	1	3
Georgia	37	14	0	0	8	0	0	0	0	4	8
Florida	16	4	0	0	0	0	0	0	0	0	3
E. SO. CEN.											
Kentucky	84	88	0	0	0	0	0	0	0	0	0
Tennessee	26	64	0	0	0	0	0	0	0	2	0
Alabama	37	25	0	0	0	0	0	0	0	1	8
Mississippi [3]	----	----	0	0	0	0	0	0	0	3	0
W. SO. CEN.											
Arkansas	11	8	0	3	0	0	0	0	0	0	0
Louisiana	3	3	0	0	0	0	1	1	0	1	1
Oklahoma	6	29	0	0	0	0	0	0	0	0	0
Texas	172	340	0	2	29	0	0	0	0	1	19
MOUNTAIN											
Montana	21	5	0	0	0	0	0	0	0	0	0
Idaho	11	9	0	0	0	0	0	0	0	0	0
Wyoming	3	2	0	0	0	0	0	0	0	0	0
Colorado	36	55	0	0	0	0	0	0	0	0	0
New Mexico	53	14	0	0	0	5	0	0	0	0	0
Arizona	56	33	0	0	0	0	0	0	0	0	0
Utah [2]	40	120	0	0	0	0	0	0	0	0	0
Nevada	8	6	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	111	73	0	0	0	0	0	0	0	0	0
Oregon	31	15	0	0	8	0	0	0	0	0	0
California	244	259	0	0	0	0	0	0	0	0	1
Total	3,811	3,623	2	11	67	20	4	2	0	19	46
6 weeks	25,512	25,887	----	----	----	----	----	----	----	----	----

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Figures for Arkansas include delayed reports as follows: Measles, 13; influenza, 3.

WEEKLY REPORTS FROM CITIES

City reports for week ended January 31, 1942

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
Atlanta, Ga	1	0	45	2	6	0	6	0	5	0	0	1
Baltimore, Md	1	0	3	2	170	4	18	0	22	0	1	30
Barre, Vt	0	0	------	0	0	0	0	0	0	0	0	0
Billings, Mont	0	0	------	0	0	0	2	0	0	0	0	0
Birmingham, Ala	3	1	91	1	1	0	5	0	0	0	0	3
Boise, Idaho	0	0	------	0	0	0	1	0	0	0	0	0
Boston, Mass	0	0	------	1	39	0	19	0	72	0		59
Bridgeport, Conn	0	0	------	0	1	1	2	0	5	0	0	1
Brunswick, Ga	0	0	------	0	70	0	0	0	0	0	0	0
Buffalo, N. Y	0	0	------	0	3	0	6	0	27	0	0	8
Camden, N. J	1	0	------	0	11	0	0	0	11	0	0	3
Charleston, S. C	0	0	70	0	0	0	0	0	2	0	0	3
Charleston, W. Va	0	0	1	0	1	0	0	0	0	0	0	0
Chicago, Ill	17	0	15	3	49	0	26	0	109	0	1	104
Cincinnati, Ohio	1	0	2	1	0	0	4	0	22	0	0	14
Cleveland, Ohio	0	0	13	1	7	0	8	0	40	0	1	33
Columbus, Ohio	0	0	1	1	12	0	2	0	10	0	1	10
Concord, N. H	0	0	------	0	0	1	1	0	0	0	0	0
Cumberland, Md	0	0	------	0	5	0	1	0	2	0	1	0
Dallas, Tex	0	0	1	1	58	0	4	1	10	0	1	9
Denver, Colo	6	0	26	0	41	0	7	0	7	0	0	11
Detroit, Mich	4	0	7	0	44	0	9	0	158	0	1	76
Duluth, Minn	0	0	------	0	4	0	0	0	12	0	0	5
Fall River, Mass	1	0	------	0	0	0	0	0	36	0	0	1
Fargo, N. Dak	0	0	------	0	0	0	0	0	0	0	0	1
Flint, Mich	0	0	------	0	0	0	1	0	1	0	0	9
Fort Wayne, Ind	0	0	------	0	3	0	2	0	1	0	0	0
Frederick, Md	0	0	------	0	7	0	1	0	1	0	0	0
Galveston, Tex	0	0	------	1	0	0	0	0	0	0	0	0
Grand Rapids, Mich	0	0	------	0	9	0	2	0	6	0	0	7
Great Falls, Mont	0	0	------	0	29	0	0	0	1	0	0	7
Hartford, Conn	0	0	------	0	8	0	0	0	4	0	0	12
Helena, Mont	0	0	------	0	0	0	0	0	1	0	0	1
Houston, Tex	5	0	------	0	4	0	8	0	4	0	3	2
Indianapolis, Ind	3	0	------	0	6	0	12	0	14	0	0	18
Kansas City, Mo	0	0	------	0	4	0	5	0	24	0	0	6
Kenosha, Wis	0	0	------	0	1	0	0	0	4	0	0	7
Little Rock, Ark	0	0	------	0	41	0	1	0	0	0	0	4
Los Angeles, Calif	2	0	35	2	104	1	20	0	32	0	0	9
Lynchburg, Va	0	0	------	0	0	0	2	0	0	0	0	2
Memphis, Tenn	1	0	20	1	6	0	4	0	6	0	0	7
Milwaukee, Wis	0	0	------	0	31	0	0	0	35	0	0	126
Minneapolis, Minn	1	0	------	1	32	0	6	0	17	0	0	13
Missoula, Mont	0	0	------	0	0	0	1	0	0	0	0	0
Mobile, Ala	0	0	1	0	9	0	1	0	0	0	0	0
Nashville, Tenn	1	0	------	0	1	0	5	0	4	0	0	0
Newark, N. J	0	0	9	0	29	0	10	0	30	0	0	24
New Haven, Conn	0	0	------	0	47	0	1	0	3	0	0	3
New Orleans, La	3	1	8	3	2	0	13	0	5	0	3	1
New York, N. Y	23	0	13	3	46	6	77	0	176	0	0	341
Omaha, Nebr	0	0	------	0	25	0	1	0	4	0	0	0
Philadelphia, Pa	2	0	3	3	19	0	36	0	132	0	1	45
Pittsburgh, Pa	1	0	4	5	8	2	17	0	12	0	0	12
Portland, Maine	0	0	------	0	8	0	3	0	7	0	0	5
Providence, R. I	1	0	------	0	20	0	6	0	3	0	0	18

City reports for week ended January 31, 1942—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
Pueblo, Colo	0	0	------	0	71	0	3	0	5	0	0	0
Racine, Wis	0	0	------	0	3	0	0	0	13	0	0	11
Raleigh, N. C	0	0	------	0	14	0	2	0	4	0	0	3
Reading, Pa	0	0	------	1	3	0	3	0	0	0	0	2
Richmond, Va	1	0	1	1	2	0	4	0	3	0	0	0
Roanoke, Va	0	0	------	0	0	1	0	0	1	0	0	1
Rochester, N. Y	0	0	------	0	24	1	3	0	4	0	1	12
Sacramento, Calif	1	0	------	0	125	0	3	0	3	0	0	9
St. Joseph, Mo	0	0	------	0	4	0	11	0	2	0	0	0
St. Louis, Mo	0	0	4	1	45	0	12	0	25	0	0	7
St. Paul, Minn	0	0	------	0	173	0	8	0	6	0	0	36
San Antonio, Tex	0	0	19	2	3	0	3	0	3	0	0	2
San Francisco, Calif	0	0	1	0	34	1	5	0	5	0	0	7
Savannah, Ga	0	0	38	1	59	0	1	0	3	0	0	3
Seattle, Wash	0	0	------	1	0	0	7	0	5	0	0	32
Shreveport, La	2	0	------	0	2	0	0	0	0	0	0	0
South Bend, Ind	1	0	------	0	0	0	0	0	12	0	0	2
Spokane, Wash	0	0	------	0	2	1	0	0	3	0	0	10
Springfield, Ill	0	0	------	0	3	0	2	0	2	0	0	0
Springfield, Mass	0	0	------	0	5	1	2	0	14	0	0	35
Superior, Wis	0	0	------	0	1	0	0	0	0	0	0	4
Syracuse, N. Y	0	0	------	0	3	0	0	0	9	0	1	33
Tacoma, Wash	0	0	------	1	0	0	0	0	0	0	0	3
Tampa, Fla	0	0	------	0	1	0	1	0	0	0	0	1
Terre Haute, Ind	0	0	------	0	0	0	2	0	1	0	0	0
Topeka, Kans	0	0	------	0	10	0	1	0	5	0	0	7
Trenton, N. J	0	0	------	0	1	1	0	0	3	0	0	7
Washington, D. C	0	0	1	0	11	4	7	0	13	0	1	22
Wheeling, W. Va	0	0	------	0	76	0	1	0	0	0	0	1
Wichita, Kans	0	1	1	0	0	0	6	0	7	0	0	4
Wilmington, Del	0	0	------	0	0	0	8	0	23	0	0	2
Wilmington, N. C	0	0	------	0	162	0	2	0	0	0	0	4
Winston-Salem, N. C	0	0	10	0	79	0	3	0	2	0	0	0
Worcester, Mass	0	0	------	0	3	0	5	0	37	0	0	26

Dysentery, amebic.—Cases: Chicago, 2; Los Angeles, 1.
Dysentery, bacillary.—Cases: Los Angeles, 1; Rochester, 1; Syracuse, 13.
Dysentery, Unspecified.—Cases: San Antonio, 1.
Encephalitis, infectious.—Cases: Birmingham, 1; New Orleans, 1.
Tularemia.—Cases: Chicago, 2; Memphis, 2; New Orleans, 1.
Typhus fever.—Cases: Houston, 1; Los Angeles, 1; New York, 1; Richmond, 1; Savannah, 2.

Rates (annual basis) per 100,000 population for a group of 89 selected cities (population, 1942, 33,979,708)

Period	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Typhoid fever cases	Whooping cough cases
		Cases	Deaths						
Week ended Jan. 31, 1942	12.75	68.06	6.15	298.05	70.83	198.19	0.00	2.61	205.41
Average for week, 1937–41	21.09	374.80	24.19	538.56	134.91	231.21	5.43	2.46	176.00

TERRITORIES AND POSSESSIONS

HAWAII TERRITORY

Plague (rodent).—Twelve rats found during the period November 25 to December 22, 1941, in Paauhau, Hamakua District, Island of Hawaii, T. H., have been proved positive for plague.

VIRGIN ISLANDS OF THE UNITED STATES

Notifiable diseases—October–December 1941.—During the months of October, November, and December, 1941, cases of certain notifiable diseases were reported in the Virgin Islands of the United States as follows:

Disease	October	November	December	Disease	October	November	December
Chickenpox			1	Malaria	1	2	2
Dengue	54	12	6	Schistosomiasis			1
Dysentary (amebic)		1		Sprue		1	
Filariasis	6	12	10	Syphilis	55	31	30
Gonorrhea	15	26	25	Tuberculosis	5	1	1
Hookworm disease	2	3	6	Vincent's infection		1	

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended January 17, 1942.—During the week ended January 17, 1942, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis		3		1	5	79		1		89
Chickenpox		33	1	179	455		47	27	116	858
Diphtheria		24		13	4	3	1		1	46
Encephalomyelitis							1			1
German measles	3	2		6	29	16	9	10	23	98
Influenza		19			2	8			62	91
Measles		1	2	290	115	75	43	13	46	585
Mumps		7	2	340	334	86	185	18	248	1,220
Pneumonia		7			24	2			7	40
Poliomyelitis			1							1
Scarlet fever		24	7	171	248	23	21	36	20	550
Trachoma									1	1
Tuberculosis	5	2	7	53	42			1		110
Typhoid and paratyphoid fever			2	12	2				1	17
Undulant fever					1					1
Whooping cough		36	9	159	102	2	2	2	27	339
Other communicable diseases		2		5	222	5	5		1	240

JAMAICA

Communicable diseases—4 weeks ended January 17, 1942.—During the 4 weeks ended January 17, 1942, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chickenpox	2	3	Puerperal sepsis		2
Diphtheria	2	6	Tuberculosis	15	68
Erysipelas		1	Typhoid fever	7	42
Poliomyelitis		1	Typhus fever		1

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual prevalence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A cumulative table showing the reported prevalence of these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

Plague

Morocco—Correction.—The total number of cases of plague in Morocco for the period January to October 1941, shown on page 183 of the PUBLIC HEALTH REPORTS of January 30, 1942, should have been 2,117 instead of 2,127 as reported. For the same period only 1 case of plague was reported in Casablanca, Morocco, instead of 4 cases as shown.

Peru.—During the month of December 1941, plague was reported in Peru by Departments as follows: Libertad, 1 case, 1 death; Lima, 7 cases, 5 deaths; Piura, 1 case.

Smallpox

Tunisia—Tunis.—During the week ended December 20, 1941, 1 case of smallpox was reported in Tunis, Tunisia.

Typhus Fever

Algeria.—During the period January 1–10, 1942, 1,004 cases of typhus fever were reported in Algeria. During the month of December 1941, 2,077 cases were reported.

Spain.—For the week ended January 10, 1942, 173 cases of typhus fever were reported in Spain, and for the week ended January 3, 1942, 135 cases were reported.

Yellow Fever

Sudan (French)—Kouremale.—On January 31, 1942, 1 death from suspected yellow fever was reported in Kouremale, French Sudan.

COURT DECISION ON PUBLIC HEALTH

Records of county health commissioner concerning typhoid carrier held not privileged.—(New York Court of Appeals; *Thomas* v. *Morris et al.*, 36 N.E.2d 141; decided July 29, 1941.) An action was brought by the plaintiff, as administrator, for damages for the death of a person from typhoid fever. It was alleged that the fatal bacillus was transmitted to the decedent by reason of the negligent conduct of the defendant who, it was charged, prepared and handled food served to the decedent, a guest at defendant's hotel, notwithstanding that the defendant was, to her own knowledge, a typhoid carrier. The plaintiff sought an order requiring a county health commissioner and the

State department of health each to produce at the trial such records and papers as might indicate whether or not the defendant was a typhoid carrier and, if so, might show what, if any, knowledge the defendant had of such condition and what, if any, information was furnished her by the county or State health departments to the effect that she could transmit the disease to others. The State was willing to produce its records but the county health commissioner opposed the plaintiff's motion and, when the trial court granted an order for the issuance of a subpena duces tecum, appealed to the appellate division of the supreme court. The appellate division reversed the trial court's order, holding that the records were privileged under section 352 of the civil practice act and that the county health commissioner could not be required to bring them into court. The case was carried to the New York Court of Appeals which took the view that the order of the trial court was correct and that the records kept by the county health commissioner in the course of his official duties could be made available to the plaintiff.

"We decide," said the court, "that no privilege attaches to these records and that the public policy of the State as expressed in the public health law (Consol. Laws, ch. 45) and the State sanitary code, confers no such privilege." Privilege was stated not to exist unless conferred by some statute and that here the statutes pointed the other way and seemed to require that such records, insofar as they referred to known or suspected typhoid carriers, be made available in a case like the instant one. The sanitary code, which had the force of law, required local health officers to keep the State health department informed regarding the names, ages, and addresses of known or suspected typhoid carriers, to furnish to the department necessary specimens for laboratory examination, to inform the carrier and members of his household of the situation, and to exercise certain controls over the activities of the carriers, including a prohibition against any handling by a carrier of food which was to be consumed by persons other than members of his own household. Answering its own question of why should the record of compliance by the county health officer with these salutary requirements be kept confidential, the court said that, hidden in the files of the health office, it served no public purpose except a bare statistical one, but that, made available to those with a legitimate ground for inquiry, it was effective to check the spread of the disease. "It would be worse than useless to keep secret an order by a public officer that a certain typhoid carrier must not handle foods which are to be served to the public."

Section 352 of the civil practice act was held not to control in the instant case, the court saying that the information, if any, in the health commissioner's files concerning the defendant was not acquired by the

commissioner "in attending a patient in a professional capacity" nor was the information "necessary to enable him to act in that capacity." Although the information may have come to the commissioner from a physician in private practice, the transmittal from the physician to the commissioner was in obedience to the express command of law. Also, the court was of the view that an intention that the communicable disease records should not be kept confidential was found in the history of such law. Since 1909, said the court, the law had provided that reports as to tuberculosis should not be divulged or made public. In 1939 an amendment named three other diseases, not including typhoid fever, as to which reports should be kept secret. "It seems to follow that similar reports as to other communicable diseases are not so privileged."

COURT DECISION ON PUBLIC HEALTH

Use of paper containers in the sale of milk.—(United States Circuit Court of Appeals, Seventh Circuit; *Fieldcrest Dairies, Inc.*, v. *City of Chicago, et al.*, 122 F.2d 132; decided August 4, 1941.) In January 1935, the city of Chicago adopted an ordinance regulating the production and distribution of milk in the city. One of the provisions of this ordinance read: "Any milk or milk products sold in quantities of less than one gallon shall be delivered in standard milk bottles; provided, however, that nothing herein contained shall be construed to prohibit hotels, soda fountains, restaurants, and similar establishments from dispensing milk or milk products from sanitary dispensers approved by the board of health." The plaintiff corporation sought a judicial declaration that the above-quoted requirement that milk be delivered in "standard milk bottles" did not prohibit the sale of milk in the plaintiff's paper containers or that, if it did, the provision of the ordinance was invalid. Also, an injunction was sought restraining the defendants from interfering with the sale of milk in such paper containers.

The court of appeals concluded that the use of the plaintiff's paper containers for the delivery of milk in the city was prohibited by the ordinance, taking the view that what the city council meant and intended by standard milk bottle was the glass bottle in universal use at the time of the adoption of the ordinance. The language of the ordinance had to be construed as it was intended to be understood when the ordinance was passed, and the court pointed out that the use of paper containers was scarcely known when the ordinance was enacted.

In connection with the attack made upon the validity of the ordinance, the court proceeded to consider the legislation enacted by the Illinois Legislature in July 1939, during the pendency of the instant suit. By this lengthy statute, as well as by the regulations

promulgated pursuant thereto, the State undertook to regulate the pasteurization of milk and the sale and distribution thereof, and, according to the court, it was plain that the use of single service containers, such as those of the plaintiff, for the distribution of milk was permitted and approved upon compliance with the act. "Thus," said the court, "we are confronted with a situation wherein the State on the one hand has expressly recognized and made provision for the use of a single service container for the sale and distribution of milk upon compliance with the requirements of the act, and regulations lawfully promulgated in conformity therewith, and on the other hand, with the provision of the city ordinance which prohibits such use." The conclusion was reached that the portion of the ordinance prohibiting the plaintiff from distributing milk in single service containers was contrary to the public policy of the State and void. The court said, however, that it had no doubt that the city, by virtue of a saving clause contained in the statute, had the power to regulate paper containers and held that the plaintiff was entitled to an injunction restraining the defendants from prohibiting, but not from regulating, the use of such containers.

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